

**DYNAMIC PERFORMANCE MONITORING-BASED APPROACH TO  
MEMORY MANAGEMENT**

**Abstract**

Techniques are described for optimizing memory management in a processor system. The techniques may be implemented on processors that include on-chip performance monitoring and on systems where an external performance monitor is coupled to a processor. Processors that include a Performance Monitoring Unit (PMU) are examples. The PMU may store data on read and write cache misses, as well as data on translation lookaside buffer (TLB) misses. The data from the PMU is used to determine if any memory regions within a memory heap are delinquent memory regions, i.e., regions exhibiting high numbers of memory problems or stalls. If delinquent memory regions are found, the memory manager, such as a garbage collection routine, can efficiently optimize memory performance as well as the mutators performance by improving the layout of objects in the heap. In this way, memory management routines may be focused based on dynamic and real-time memory performance data.